

U.S. Patent Application Serial No. 10/678,256
Response filed December 12, 2005
Reply to OA dated September 14, 2005

REMARKS

Claims 1-18 are pending in this application. An amendment has been made herein amending claims 1 and 7, and adding new claim 19. Upon entry of this amendment, claims 1 - 19 will be pending. Entry of this amendment and reconsideration of the rejections are respectfully requested.

No new matter has been introduced by this Amendment. Support for the amendments to the claims is discussed below.

The amendment to claim 1 regarding the compound of formula (I-a) is supported by the specification of the application, which states on page 10, lines 6 to 7: "For a compound represented by the general formula (I-a), the temperature characteristics of the natural pitch that is induced upon addition to a nematic liquid crystal are negative." The amendment to the last lines of claim 1 rewrites these lines, for clarity.

Claim 7 has been amended to depend from claim 3.

New claim 19 is supported by page 42, lines 22 to 24, in the specification of the application.

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP9-217062.

(Office action paragraph no. 4)

The rejection of claims 1-18 is overcome by the amendment to claim 1. As noted above, claim 1 has been amended to recite with regard to the compound of formula (I-a): "wherein the natural pitch induced upon addition of the compound represented by general formula (I-a) to a nematic liquid crystal decreases with increasing temperature".

The Examiner considers 80BBE1*(Me)B to be a compound of formula (I-a), and the Examiner considers 21*(Me)10BBC to be a compound to formula (II-a). The Examiner is correct in this regard.

However, claim 1 recites a composition with both a compound of formula (I-a) and a compound of formula (II-a), and requires that the natural pitch induced upon addition of the compound of formula (I-a) **decreases** with increasing temperature (i.e., is a “negative” compound) and that the natural pitch induced by addition of the compound of formula (II-a) **increases** with increasing temperature (i.e., a “positive” compound). There is no disclosure in JP’062 of a combination of a negative compound and a positive compound in the temperature characteristics (temperature dependency) of the natural pitch.

In Example 17 of JP ‘062 (paragraph [0053]), a liquid crystal composition comprising two optically active compounds, 80BBE1*(Et)B and 21*(Me)10BBC, is disclosed. However, the temperature characteristic of the natural pitch of 80BBE1*(Et)B included in Example 17 of the reference is **positive**, as can be seen from Example 8 in paragraph [0044], which uses only 80BBE1*(Et)B as a chiral compound, and in which the δP is positive ($\delta P=0.14$). Therefore, this Example of JP ‘062 does **not** provide a compound of formula (I-a) for which the natural pitch induced decreases with increasing temperature.

In the rejection, the Examiner substitutes 80BBE1*(Me)B for 80BBE1(Et)B in Example 16 of JP’062, stating that these are functionally equivalent (page 3, second paragraph, of the Office

action). However, in present claim 1, the compound of general formula (I-a) is a negative compound, and the optically active compounds of general formula (I-a) in the present invention and 80BBE1*(Et)B in the reference are not functionally equivalent at all.

In addition to noting that none of the Examples in JP'052 anticipates the present invention, Applicant further argues that there is no disclosure or suggestion in the reference to use two optically active compounds with different temperature characteristics of the natural pitch in a composition.

The parameters δP described in the reference and ΔW of the present application are basically the same. However, since the present application measures a wide temperature range **from 0 to 50°C**, these conditions are rigid compared with the reference (**from 20 to 50°C**). The temperature characteristics of liquid crystal compositions using various optically active compounds are summarized in the following table.

		Optically Active Compounds		Temperature Characteristics
		first element	second element	
JP9-217062	Example 8	80BBE1*(Et)B	none	0.14
	Example 10	80BBE1*(Me)B	none	-0.12
	Example 17	80BBE1*(Et)B	21*(Me)10BBC	0.19
the Present Application	Example 1	formula(VI-e)	formula(X-a)	0.0071
	Example 2	formula(VI-e)	formula(X-a)	0.0072
	Example 3	formula(VI-e)	formula(VI-g)	-0.0071
	Example 4	formula(VI-e)	formula(VI-g)	0.0036
	Example 5	formula(VI-e)	formula(X-a)	-0.0036

The compound of Example 8 of JP'062 differs from that of general formula (I-a) in that the

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methyl group in the compound represented by general formula (I-a) of the present application becomes an ethyl group in the compound in the reference. The compound of Example 10 of the reference is a compound represented by general formula (I-a) of the present application. The temperature characteristics of the natural pitch are reversed for these two compounds, and the rates of change are almost equivalent.

The composition of Example 17 of the reference uses two kinds of optically active compounds, and one of them is the same as the compound described in Example 8. While Example 8, which uses only 80BBE1*(Et)B, has a value of δP of 0.14 (see paragraph [0044]), the temperature characteristic of the composition of Example 17 actually deteriorates, being 0.19. Therefore, improvement of the temperature characteristic by using two kinds of optically active compounds is not suggested by Example 17 of the reference.

On the other hand, the compositions in the Examples of the present application have temperature characteristics with significant differences of two digits compared with Example 17 of the reference. For example, the composition of Example 1, with the most similar component to the reference, has a temperature characteristic of 0.0071. Moreover, since ΔW of the present application is for the temperature range of 0-50°C, the differences in the effect extend further if ΔW is for the range 20-50°C, the same as in the reference. As to compositions other than Example 1, the differences in the temperature characteristics compared with the reference are clear, and Examples 4 and 5 have a value of 0.0036, which is extremely excellent.

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Accordingly, Applicant therefore submits that claims 1-18 are not anticipated by, and are not obvious over, JP9-217062.

Regarding new claim 19.

As claim 19 depends from claim 1, Applicant submits that claim 19 is also not obvious over JP9-217062.

In view of the aforementioned amendments and accompanying remarks, the claims, as amended, are in condition for allowance, which action, at an early date, is requested.

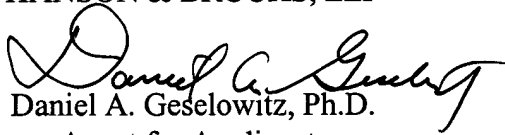
If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the Applicant's undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

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In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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